What is Claimed is:

[c1] An object sensor usable to sense a position of an object, comprising:

a substrate having a surface;

a plurality of discrete light energy detectors distributed over the surface of a detector portion of the substrate, each discrete light energy detector having a two dimensional detection surface having an area that is a non-negligible percentage of the detector portion, the plurality of light energy detectors arranged in a two-dimensional array such that the detection surfaces of the plurality of light energy detectors substantially fill the detector portion of the substrate; and

at least one light source arranged relative to the detector portion of the substrate to illuminate the plurality of discrete light energy detectors in absence of the object.

[c2] The object sensor according to claim 1, further comprising a plurality of local controllers, each local controller connected to a corresponding subset of the plurality of light energy detectors.

[c3] The object sensor according to claim 2, wherein each of the plurality of local controllers is positioned relative to the corresponding subset of the plurality of light energy detectors on the substrate.

[c4] The object sensor according to claim 1, wherein the at least one light source is mounted on a second substrate positioned opposite the light energy detectors.

[c5] The object sensor of claim 4, wherein the at least one light source is located at distance from the plurality of light energy detectors sufficient to effectively collimate the light from the at least one light source relative to the plurality of light energy detectors.

[c6] The object sensor of claim 4, further comprising at least one collimating element located between the at least one light source and the plurality of light energy detectors such that light not blocked by the object to be sensed passes through the at least one collimating element and to the plurality of light energy detectors.

[c7] The object sensor of claim 4, wherein the at least one light source comprises a plurality of light sources.

[c8] The object sensor of claim 7, wherein the plurality of light sources are distributed relative to the plurality of light energy detectors in two dimensions.

[c9] The object sensor according to claim 1, wherein the at least one light source is mounted on the substrate adjacent to the light energy detectors.

[c10] The object sensor of claim 9, wherein the at least one light source comprises a plurality of light sources.

[c11] The object sensor of claim 10, wherein the plurality of light sources are distributed relative to the plurality of light energy detectors in two dimensions.

[c12] The object sensor according to claim 11, wherein at least some of the plurality of light energy detectors and some of the plurality of light sources are arranged in a two-dimensional array.

[c13] The object sensor according to claim 10, further comprising a collimating film positioned adjacent to the plurality of light sources, the collimating film having individual windows corresponding to each light source.

[c14] The object sensor according to claim 1, wherein:

the at least one light source comprises a plurality of light sources;

at least some of each of the plurality of light sources is mounted on the substrate within one of the light energy detectors.

[c15] The object sensor according to claim 14, further comprising a collimating film positioned adjacent to the plurality of light sources, the collimating film having individual windows corresponding to each light source.

[c16] The object sensor of claim 1, further comprising a collimating film positioned over the plurality of light energy detectors.

[c17] The object sensor according to claim 16, further comprising a transmissive plate positioned over the collimating film, the transmissive plate having one side facing to the collimating film and an opposite side forming a surface over

which the object may travel.

[c18] The object sensor according to claim 17, wherein the transmissive plate comprises plastic material.

[c19] The object sensor according to claim 1, further comprising a plurality of signal processing circuits, each signal processing circuit connected to a corresponding subset of the plurality of light energy detectors.

[c20] The object sensor according to claim 19, wherein each of the plurality of signal processing circuits is positioned relative to the corresponding subset of the plurality of light energy detectors on the substrate.

[c21] The object sensor according to claim 1, wherein the plurality of light energy detectors are formed by a photoreceptor sheet, each light energy detector comprising a portion of the photoreceptor sheet.

[c22] The object sensor according to claim 21, wherein the photoreceptor sheet is bonded to the substrate using a conducting adhesive.

[c23] The object sensor according to claim 21, further comprising a plurality of windows corresponding to the plurality of light sources, each window extending through the photoreceptor sheet.

[c24] The object sensor according to claim 23, wherein a light shield is disposed around the outer surface of the light source.

[c25] The object sensor of claim 21, further comprising a collimating film positioned over the photoreceptor sheet, wherein each window further extends through the collimating film.

[c26] The object sensor according to claim 1, wherein the light energy detectors are solar cells.

[c27] The object sensor according to claim 1, wherein at least one light source substantially evenly illuminates the plurality of discrete light energy detectors in absence of the object.

[c28] The object sensor of claim 1, wherein the lateral dimensions of the light energy detectors are at least 1 mm in diameter.

[c29] A method of detecting at least one of a presence, a position, a size, a shape and an orientation of an object using a plurality of discrete light energy detectors distributed over the surface of a detector portion of the substrate, each discrete light energy detector having a two dimensional detection surface having an area that is a non-negligible percentage of the detector portion, the plurality of light energy detectors arranged in two dimensions such that the detection surfaces the plurality of light energy detectors substantially fill the detector portion of the substrate, the method comprising:

passing an object in proximity to the plurality of discrete light energy detectors;

emitting light energy from a plurality of light sources;

using the object to controllably determine which of the plurality of light energy detectors receive light from the plurality of light sources;

receiving the light energy at at least some of the plurality of light energy detectors based on at least some of the position, the size, the reflectivity of the object, the transmissivity of the object, and/or the orientation of the object;

transmitting a signal from each of the light energy detectors based on an amount of received light energy received at each light energy detector;

determining the at least one of the presence, the position, the size, the shape and the orientation of the object based on the transmitted signals from the light energy detectors.

[c30] The method of claim 29, further comprising:

emitting light energy from a position opposing the light energy detectors toward the light energy detectors.

[c31] The method of claim 30, further comprising collimating the emitted light before the emitted light reaches the light energy detectors.

[c32] The method of claim 22, further comprising emitting light from a plurality of positions opposing the light energy detectors toward the light energy detectors.

[c33] The method of claim 32, further comprising collimating the emitted light before the emitted light reaches the light energy detectors.

[c34] The method of claim 29, further comprising:

emitting light energy from a position to reflectively scatter from the surface of the object to the light energy detectors.

[c35] The method of claim 29, further comprising:

emitting light energy from center portions of at least some of the light energy detectors to reflectively scatter from the surface of an object to the light energy detectors.

[c36] The method of claim 29, wherein the lateral dimensions of the light energy detectors are at least 1 mm in diameter.